Table 3 River Boundary Areas Evaluation of Technologies

Technology	Description	Screening Parameter			Decision
		Site Characteristics	Waste Characteristics	Technology Limitations	
No Action	No action provides a baseline by which other technologies are compared. With this technology, no remedial efforts, improvements, or enhancements would be made.	Not Applicable	Not Applicable	Does not remediate chemicals of concern (COC) in groundwater or soil. Does not remove free-phase hydrocarbons to prevent future releases to groundwater.	This technology will not be considered further.
Institutional Controls	Institutional controls would involve the prevention of direct contact with the COC by limiting access. Site access and use would be limited through the use of physical barriers (e.g., fences, gate restrictions, etc.), security monitoring, and on-site deed restrictions.	Location of the Site would allow for access control. Site is in an industrial area which would reduce the chances for residential development.	Characteristics of the waste material and present location would encourage the use of institutional controls. Future Site development could result in the excavation of impacted soil or contact with impacted groundwater.	Does not remediate COC in groundwater or soil; however, could be combined with other technologies to provide a protective alternative.	This technology will be considered in combination with other technologies.
Air Sparging	Air would be mechanically injected into the groundwater zone to promote biodegradation and volatilization of hydrocarbons.	Site characteristics compatible.	Waste characteristics compatible.	No technology limitations.	This technology will be considered.
Engineered Physical Barrier with Hydraulic Control	A physical barrier wall would be installed in combination with hydraulic control. Dissolved and free-phase constituents would be prevented from migrating off Site.	Site characteristics compatible.	Waste characteristics compatible.	Technology would be limited by water treatment capacity at the Site treatment plant.	This technology will be considered.
Engineered Treatment Barrier	A treatment trench with funnel and gate (using air sparging system) would be constructed to treat groundwater as it passes through.	Due to proximity of river, a physical barrier would be difficult to install. Hydraulic flow conditions at the gate may prevent sufficient treatment of COC.	Waste characteristics compatible.	Contact time for treatment of COC may be limited.	This technology will be considered.
Enhanced Anaerobic Biodegradation	Electron receptors, such as sulfate, would be added to the subsurface to enhance anaerobic biodegradation.	The addition of anaerobic degradation enhancing compounds would be difficult due to proximity to river and typical groundwater velocities.	Waste characteristics compatible.	Injected compounds would require contact time to stimulate anaerobic degrading bacteria. Groundwater and river flows would limit the contact time. Subsurface heterogeneities would prevent adequate distribution of amendments.	This technology will not be considered further.

Table 3 (con't) **River Boundary Areas**
Screening of Technologies

Technology	Description	Screening Parameter			Screening Decision
		Site Characteristics	Waste Characteristics	Technology Limitations	
Enhanced Aerobic Biodegradation	Native hydrocarbon-degrading bacteria would be stimulated, through the introduction of oxygen and nutrients, to promote and enhance biodegradation.	The addition of aerobic degradation enhancing compounds would be difficult due to proximity to river and typical groundwater velocities.	Waste characteristics compatible.	Injected compounds would require contact time to stimulate aerobic degrading bacteria. Groundwater and river flows would limit the contact time. Subsurface heterogeneities would prevent adequate distribution of amendments.	This technology will not be considered further.
Hydraulic Control	Groundwater pumping wells would be installed and operated to control the hydraulic gradient and prevent migration of COC.	Site characteristics compatible.	Waste characteristics compatible.	Technology would be limited by water treatment capacity at the Site treatment plant.	This technology will be considered.
Monitored Natural Attenuation	Natural attenuation would be used to prevent COC from reaching Site boundaries.	Site characteristics compatible.	Waste characteristics compatible.	No technology limitations.	This technology will be considered.
Oxygen Release Compound	An oxygen release compound would be injected into the subsuface to release oxygen to groundwater and enhance aerobic biodegradation.	Site characteristics compatible.	Waste characteristics compatible.	Oxygen release compounds would not provide the area of influence that air sparging produces. The efficiency of oxygen transfer is also questionable.	This technology will not be considered further.
Phytoremediation	Specific plants and trees would be planted at strategic areas of the Site to remove dissolved hydrocarbons from groundwater and to help control the migration of COC.	Site characteristics compatible.	Waste characteristics compatible.	Effectiveness may be limited until vegetation is fully established.	This technology will be considered.

Note: COC = constituents of concern
NAPL = non-aqueous phase liquid